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RESEARCH REPORT

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Assessing The Impacts Of Environmental Regulations On The Food Processing Industry In Vietnam

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This EEPSEA study from Vietnam assesses the effectiveness of Decree 67, a key piece of the country's 'polluter-pays' environmental legislation. Industrial waste-water pollution is one of the most significant environmental problems affecting Vietnam. Although the country has implemented a range of anti-pollution legislation, the problem has not been resolved and companies continue to pollute on a large scale. This makes it important to understand why current environmental legislation is not working and what must be done to improve the situation. The study is the work of Le Ha Thanh from Hanoi Economics University. It looks at the impact of Decree 67 on food processing companies in Hanoi and Ho Chi Minh City.

The study finds that, although the legislation has been successful in raising environmental awareness among businesses, it has been less successful at stopping pollution. Overall, Decree 67 has had a minimal impact and is poorly implemented and enforced. The study shows that many company owners and managers have an adequate knowledge of environmental protection. It is also clear that companies do not consider environmental protection a top priority. Overall, environmental costs are not being fully internalized by businesses. The study makes a number of suggestions for how Decree 67 can be made more effective. Recommendations include reducing the scope of the legislation to make it easier to implement and a phased increased in the charges that are levied on polluting

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ASSESSING THE IMPACTS OF ENVIRONMENTAL REGULATIONS ON THE FOOD PROCESSING INDUSTRY IN VIETNAM

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EEPSEA was established in May 1993 to support research and training in environmental and resource economics. Its objective is to enhance local capacity to undertake the economic analysis of environmental problems and policies. It uses a networking approach, involving courses, meetings, technical support, access to literature and opportunities for comparative research. Member countries are Thailand, Malaysia, Indonesia, the Philippines, Vietnam, Cambodia, Lao PDR, China, and Papua New Guinea.

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LIST OF ABBREVIATIONS

BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
Circular 125	Inter-ministerial Circular no.125/2003/TTLT-BTC-BTNMT
DoNRE	Department of Natural Resources and Environment
DoI	Department of Industry
DoS	Department of Statistics
Decree 67	Decree 67/2003/ND-CP
EPFIW	Environmental protection fees for industrial waste water
FDI	Foreign Direct Investment
IP/IZ	Industrial Parks/Industrial Zones
HCMC	Ho Chi Minh City
LEP	Law on Environmental Protection
MoF	Ministry of Finance
MoNRE	Ministry of Natural Resources and Environment
RGDP	Regional GDP
TCVN 5945-1995	Vietnamese standard for wastewater
TSS	Total Suspended Solid

EXECUTIVE SUMMARY

Applying economic instruments to environmental management is the right approach to managing the current environmental pollution in Vietnam. By charging industrial wastewater fees (*Decree 67)*, the Government of Vietnam has clearly signaled that it is embarking on a significantly greater use of economic instruments as a policy tool to prevent the further degradation of the country's environment and to improve environmental quality.

This study aimed to generate evidence to inform decision-makers about the effectiveness of *Decree 67* in inducing changes in pollution abatement behavior of Vietnamese firms and the factors affecting their environmental performance.

Decree 67 has been successful in raising environmental awareness among the different stakeholders, especially business enterprises. The declining trend in average fees paid by industrial firms may reflect the slight effect of *Decree 67* in inducing changes in the pollution control behavior of firms. However, this trend may also imply some weaknesses in the implementation process. The weaknesses may include lack of appropriate knowledge, awareness, and management capacity at all levels. There is little or no evidence that the top government agencies have sufficient environmental/financial knowledge and capacity to effectively implement *Decree 67*.

Regarding the firms' environmental performance, the study's results indicate a rather poor performance iof the food processing industry. Most companies show little concern for environmental improvement. They are not under much pressure to change.

It was also found that the government remains to be the most important source of pressure on companies to improve their environmental performance. However, this advantage largely depends on the government's enforcement and inspection capacity. Also, exposure to the export market can be a potential source of motivation for firms to have a good environmental performance, particularly when enterprises try to expand their market. The other sources of pressure for environmental improvement include the general public and type of firm ownership; however, their impacts are still small at present.

1. INTRODUCTION

1.1. Description of the problem

Since the Doi Moi policy was launched in 1986, Vietnam has gained significant achievements in its development goals. But while the country has maintained its relatively high growth rate (approximately 7.5% per annum in 1991-2007) (Ohno 2008), it still faces a lot of challenges that need to be addressed if its development is to be sustained. Among these obstacles is environmental pollution, especially wastewater pollution resulting from economic activities. As the Vietnamese government continues to emphasize the role of industrialization, there is now a greater need to improve environmental policies and compliance to them by the industrial companies regarding wastewater management. The government has given high priority to the improvement of the environmental quality in the country's socioeconomic development strategy.

In the past 10 years, societal concern over the negative environmental impacts of commercial and manufacturing activities has led to a sharp increase in environmental regulations in Vietnam. Accordingly, firms face increasing environmental legislation aimed at bringing under control their emission of harmful wastes. For a long time, such controls were considered as an interference with the firms' economic activities. Despite the fact that all registered enterprises are required to manage their wastewater properly and to pay an environment protection fee on industrial wastewater under the Law on Environmental Protection (LEP) (1994)[1] and related regulations such as Decree No. 36/CP (1997)[2], Decretive No. 264 TTg (1997)[3], Decree No. 67/CP (2003), Decree No. 81/CP (2006)[4], water pollution due to industrial wastes is still very significant (Thong and Ngoc 2004). Very few factories have wastewater treatment systems. Wastewater from nearly all the industries is discharged directly to streams without any treatment. The situation has given rise to several questions from policymakers, managers of firms, and academics, such as: How effective are the environmental policies? Does the implementation of current regulations satisfy the specific objectives and requirements of the policies? What have been the impacts of the environmental regulations on firms' environmental performance? What should the government do to develop the industrial sector in a sustainable manner?

This research aims to evaluate the impacts of Vietnam's *Decree 67* on firms' behavior. This decree is Vietnam's first attempt at adopting the "polluter pays" principle (PPP) to control industrial pollution. The primary results of the implementation of wastewater fees

[1] The Law on Environment Protection (LEP) was promulgated in January 1994, amended in November 2005; the amended law came into force in July 2006.
[2] Decree No. 36/CP.1997, which provides regulations on industrial zones, export processing zone, and high tech zones.
[3] Decretive No. 264/TTg.1997, which guides the implementation of regulations on industrial estates
[4] Decree No.81/2004/ND-CP dated 09 August 2006, which provides regulations on Administrative Penalties related to environmental protection.

in Vietnam for two years, as assessed by domestic and international experts, are positive in terms of raising budget revenues for environmental protection activities and public awareness of environmental issues (MoNRE 2006). A MoNRE report (MoNRE 2006) indicates that as of 2004, the total collected wastewater fees were approximately VND 6.8 billion (equivalent to USD 425,000)[5]. The amount of collected fees in the first half of 2005 was double the amount collected in 2004. However, whether or not this intervention is able to limit the environmental pollution is not well understood. How much pollution is reduced and how the firms' environmental performance is changed as a result of the policy are not clearly established.

The lack of understanding of the current policy's impact on industrial pollution behavior is clearly a significant obstacle to the policymaking process at all levels in Vietnam. Without understanding the determinants of industrial pollution, and the firms' responses to environmental regulations, the relevant authorities are less likely to effectively respond to problems posed by the growing industrial pollution. Given the importance of this issue, the findings of this study would provide policymakers with better insights on the issues, thus enabling them to design appropriate regulations and policies.

1.2. Significance of the study

Vietnam's growing environmental problems have been extensively documented in the literature (WB 1995; UNDP 1995). Industry is the major contributor to these problems, accounting for 60-70 percent of the country's pollution load. Vietnam's industry still largely uses obsolete and outmoded technologies that are highly inefficient in the use of energy and produce significantly more pollution per unit of output than their modern counterparts in the industrialized countries (MoNRE 2002).

A survey of industrial establishments by the Vietnam National Environmental Protection Agency (VEPA) shows that 90 percent of firms do not have wastewater treatment units; their wastewater, which has a high content of organic and toxic matters, is discharged directly into the environment (CCSE 2003).

Environmental regulators in Vietnam have relied for a long time on LEP and other related laws and regulations to protect the environment and control the pollution. Unfortunately, they have been often hampered by difficulties in enforcement and high administrative cost. As Vietnam's Government seeks to implement the LEP and „polluter pays principle (PPP), economic instruments are also being reviewed. Of these tools, charging environmental protection fees on industrial wastewater (EPFIW) has drawn the attention of policymakers and economic entities, especially businesses.

With the government of Vietnam attempting to revise the policy to facilitate the implementation of EPFIW in the country, having the firms' feedback and responses to EPFIW becomes a critical need. At present, the environmental policy in Vietnam is

[5] USD 1= VND 16,000 (Source: GSO 2006). This exchange rate is applied to the whole study.

designed and drafted by a small group of officials assigned to the task. These officials work very hard but cannot produce the desired results because crucial information and cooperation from the stakeholders, especially the business community, are lacking. As such, the policy is not supported by the business community and therefore not implementable. This implies that in order to attain the policy objectives, the behavior of regulated firms has to be studied. Moreover, to understand the impacts of the regulations on the firms' environmental performance, it is important to know the nature of the firms and the settings where they operate.

It is in this context that the study aims to generate information on the effectiveness of *Decree 67* in inducing changes in pollution abatement behavior of firms over time. Information on the firms' insights and perceptions on the effectiveness and implementation of *Decree 67* would be useful input into efforts at refining and improving this policy. As far as policymaking is concerned, the outcomes of this study are expected to serve as important inputs to the relevant authorities in effectively responding to the development challenges arising from industrial pollution.

1.3. Research objectives

The overall objective of the study is to evaluate the impacts of *Decree 67* on the environmental performance of industrial firms based on their own perspective. The specific objectives are:

1. To determine the level of awareness of Vietnamese enterprises on environmental problems and environmental regulations, especially *Decree 67*.

2. To assess the effectiveness of *Decree 67* in inducing change in the environmental behavior of the firms.

3. To identify factors affecting the firms' environmental behavior.

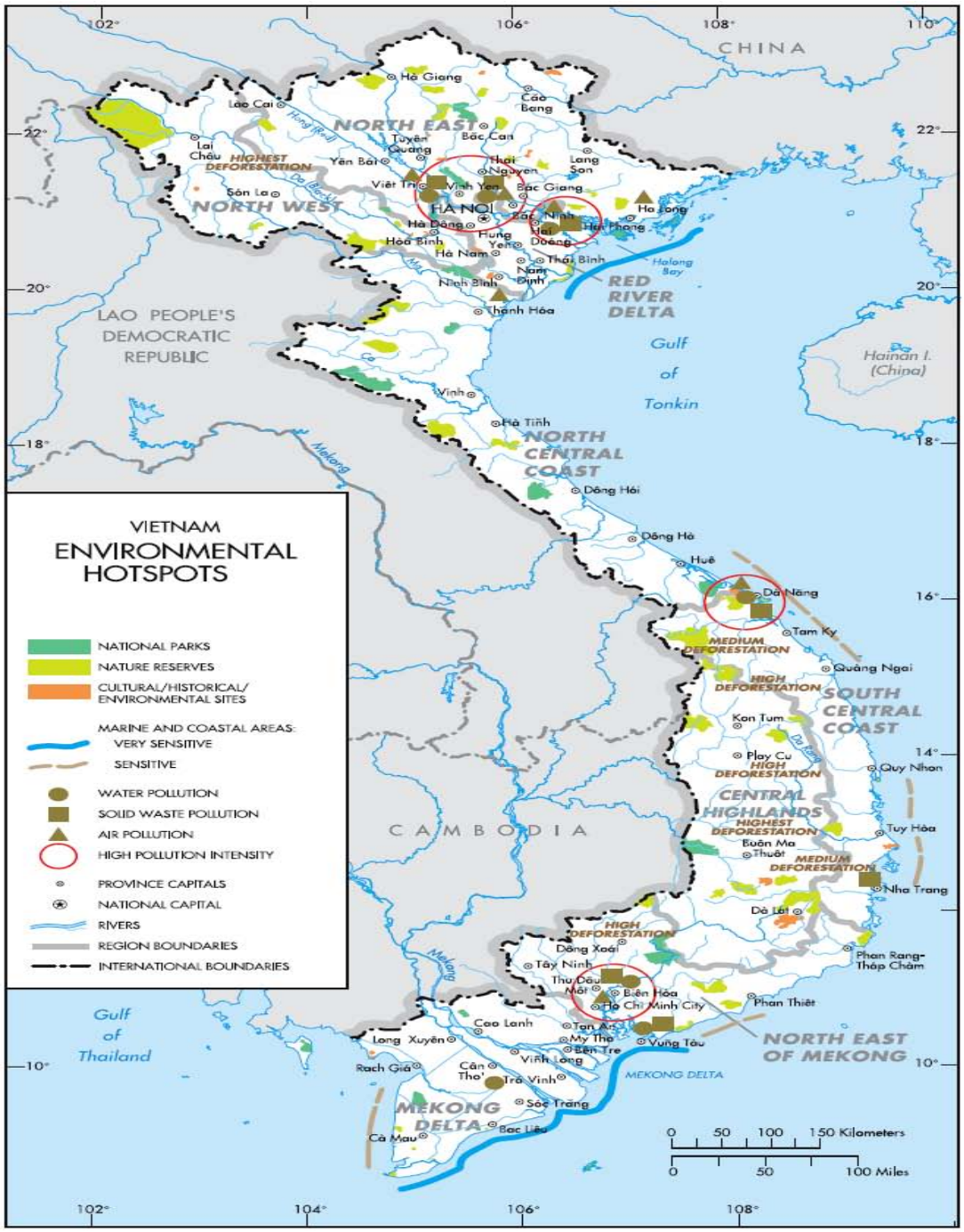
4. To provide some policy recommendations to improve the quality of the environmental policy in general and the pollution fee system in particular.

1.4. Scope of the study

Site

The focus areas of evaluation study are food-processing enterprises in Hanoi and Ho Chi Minh City (HCMC). There are two reasons for this. First, both cities have a high concentration of food processing factories and now are facing serious problems of water pollution (Figure 1). HCMC is one among the provinces where the implementation of wastewater fees has been more effective. In contrast, Hanoi belongs to the group of

provinces, where the program has not been implemented effectively. This difference may reflect the prominent role that the local governments have in policy enforcement.



Source: VEM 2003

Figure 1. Environmental Hotspots in Vietnam

Sector

The study focuses on the food-processing industry for several reasons. First, the food processing industry has experienced a high growth rate in the past 10 years, accounting for a large share in the total industrial output. Sea food, food stuffs, and many other processed food products are considered strategic export items of Vietnam up to 2010. Second, it is known as one of the most polluting industries, producing high organic pollution loads. A study of Dang (2001) showed that wastewater from the food processing industry is the main source of organic water pollution in Vietnam. Moreover, in the production of some processed food products, the wastewater contains toxic substances such as heavy metals like copper and zinc. Third, this sector is where pollution (especially organic pollution) reduction is easily possible. The biodegradable wastes measured by the BOD concentration in wastewater from the food processing industry can be removed by conventional wastewater treatment systems that have an aeration and settling module. Finally, the food processing industry is an intensive water user. The EIA report on Hanoi Brewery Company indicates that about 20 liters of water is needed to produce one liter of beer (EIA 2003).

Pollution measures

Since the EPFIW program covers seven pollutants, the study narrowed its scope to two parameters only: chemical oxygen demand (COD) and total suspended solid (TSS).

2. METHODOLOGY

2.1. Research questions to be answered

The study sought to answer the following questions:

1. Are the food processing firms aware of the environmental regulations and *Decree 67*? If so, what are the firms' perceptions about EPFIW?

2. From the firms' point of view, what have been the impacts of EPFIW on their environmental performance?

3. Does the environmental protection fee provide any incentive for firms to improve their environmental performance? What courses of action have firms done in response to the environmental protection fees?

4. What are the other factors that can best explain the environmental performance of the firms?

5. What policy options are likely to prove effective in raising the level of environmental performance of the food processing industry?

2.2. Analysis

The study used qualitative analysis to evaluate the impacts of the environmental protection fees on the firms' environmental behavior. Qualitative analysis is a multistep process to convert raw data to descriptive statement and findings. It aims to gather an in-depth understanding of firms' behavior and the reasons that govern such behavior.

In this study the qualitative impacts capture how firms perceive the wastewater fees and other sources of pressure toward pollution abatement and how these perceptions affect or influence their actions regarding environmental pollution.

2.3. Questionnaire development

Almost all information was collected by means of a survey using a standard questionnaire. The draft questionnaire was presented to MoF and MoNRE experts and other researchers for their comments. After, the questionnaire was pre-tested in five factories in Hanoi. In general, the respondents did not find it difficult to answer the questionnaire. The questionnaire was revised to address the concerns raised by the pre-test respondents.

The questionnaire has five main components. The first component sought information on the respondent's profile, such as name, address, location, size, and legal status of the concerned company. The second component gathered data on production capacity including the duration of the production cycle as well as the present working condition. The third component involved questions on the inputs related to the five main elements of production (i.e., employment, energy, materials, equipment, and water). The fourth component asked about the output of the firm, including total production, total wastewater generated, and quality of wastewater. The fifth component sought qualitative information on the firm's perception and behavior toward *Decree 67*.

2.4. Other sources of data

Field interviews were conducted to identify the motivations, practices, and opportunities for improvement of the firms' environmental performance. More importantly, the interviews obtained information on how the firms perceived the impacts of the environmental regulations and *Decree 67* on their environmental behavior. However, because of time constraint, not much trend and quantitative analysis of *Decree 67* impact had been done. To complement the survey data, data were also gathered from related studies and from available reports of various agencies (including MoNRE, MoF, and Provincial Departments of Environment, Industry, Trade, and Taxation). The secondary data from these agencies include current environmental situation and pollution control activities, wastewater standard for the food processing industry, total environmental fees paid, and possible policy options. Data on total population, households, number of food

processing factories, total production of food processing activities, etc. were collected from the statistical offices at the state, provincial, and district levels. Related information from developing countries, especially countries in the Southeast Asian region, further served as a valuable reference.

3. ENVIRONMENTAL PROTECTION FEES ON INDUSTRIAL WASTEWATER IN VIETNAM

3.1. Legal documents related to environmental protection fees

Charging an environmental protection fee (i.e., polluter pays principle) is considered by scientists as a necessary measure to deal with pollution. Such approach, however, is new and quite a sensitive one in Vietnam.

It was only in August 2001 that the Vietnamese Government issued the Ordinance on Fees and Charges. Among the 72 kinds of fees and charges, more than 16 relate to environmental protection activities, as follows:

- Environmental protection fee
- Fee for evaluation of environmental impact assessment report
- Sanitation fee
- Natural disaster prevention charge
- Charge for granting of numerical or bar code
- Charge for use of radiation safety service
- Charge for evaluation of conditions for scientific and technological activities
- Charge for evaluation of technology transfer contract
- Charge for inspection of measurement equipment
- Fee for granting of certificate of assurance of technical quality and safety for machinery, equipment, means and substances subject to stringent safety requirements
- Fee for granting of permit to use water sources
- Fee for granting of permit to discharge water into water sources
- Fee for granting of special permit to transport precious and rare forest animals and plants

3.2. Decree no. 67/2003/ND-CP[6]

[6] On 8 January 2007, the Vietnamese Government approved **Decree 04/2007/ND-CP** supplementing Decree 67/2003/ND-CP dated 13 June 2003 on environmental protection charges applicable to wastewater The content of the newly approved **Decree 04/2007/ND-CP** is the same as that of Decree 67 except for the following three issues regarding industrial wastewater:

(1) Article 6, Clause 2. The BOD parameter was removed from the list of pollutants subject to be charged;

(2) Article 8, Clause 1, regarding the use of fee collected. It states that part of the collected charges shall be left to the agencies or units directly collecting the charges to defray the expenses for charge collection; cover expenses for assessment and sampling of wastewater for analysis in service of the periodical or extraordinary examination of industrial wastewater.

Decree No. 67/2003/ND-CP[7] was signed and promulgated by the Prime Minister of Vietnam on 13 June 2003; it became officially effective from 1 January 2004. This is the first economic instrument in Vietnam following the "polluter pays principle" (PPP). *Decree 67* is the result of a study done over five to six years, which included studying the models and experiences of other countries, drafting the decree, and conducting wide consultation with researchers and policymakers. It is also a significant step toward controlling environmental pollution in Vietnam.

The main goals of *Decree 67* are: (1) to limit the environmental pollution caused by wastewater, (2) to use economically clean water, and (3) to create funding sources for the Environmental Protection Fund.

For industrial wastewater, enterprises do a self-declaration to DoNRE; DoNRE, in turn, appraises and indicates the fees to be paid. The enterprises then pay the fees at the provincial State Treasury. In principle, EPFIWs are calculated based on the pollution loads that an enterprise discharges to the environment. The pollution level is calculated based on the quantity and toxicity of pollutants contained in the wastewater.

EPFIW is calculated based on the quantity of pollutants in wastewater. The quantity of pollutants is identified based on unit of mass (m3), concentration (mg/l) of these substances to give pollution load.and the environment receiving wastewater. The Decree stipulates the ceiling (highest) and the floor (lowest) fee rates for each kilogram of pollutant (BOD, COD, TSS, Pb, Cd, Hg, As) discharged into environment. *Decree 67* also assigns the Ministry of Finance (MoF) in cooperation with the MoNRE to stipulate the fee rates in accordance to the condition of the receiving environment.

Moreover, the Decree also lists the kinds of enterprises levied with EPFIW, which include industrial production enterprises as well as agricultural, forestry, and aquaculture processing enterprises. The MoNRE and MoF are responsible for specifying these enterprises.

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(3) Article 9. MONRE should establish the emission coefficient for each pollutant for the different industrial sectors. The emission coefficient should serve as basis for fees to be levied.

However the implementation guidelines of Decree 04 have not been approved yet, so in the report the term Decree 67 refers to the EPFIW.

[7] Decree 67 covers both household (or domestic) wastewater and industrial wastewater. However, this study focuses only on industrial wastewater.

3.3.Circular no. 125/2003/TTLT-BTC-BTNMT by MoNRE

In order to provide a timely guide for the implementation of *Decree 67*, the MoNRE in cooperation with the MoF drafted and issued the joint *Circular 125*. The Circular makes clear the entities who will need to pay fees and the specific fee rates for industrial wastewater according to the type of the receiving environment. The Circular also gives specific instructions on how to calculate and declare fees, do the appraisal, announce the payment of fees, and make the payment at the State Treasury.

Fees rate. For industrial wastewater, the level of fees is regulated for seven parameters, namely: BOD, COD, TSS, and four heavy metals (mercury, lead, arsenic, and cadmium) following Table 1.

The receiving environments are classified into four types[8]:

- Type A refers to the inner city, inner town of special urban areas and types I, II, III.
- Type B refers to the inner city, inner town of urban areas types IV, V, and suburbs of special urban areas and types I, II, III.
- Type C refers to the suburbs of types IV and communes that do not belong to urban areas, except those belonging to Type D.
- Type D refers to border communes, mountainous regions, and remote regions.

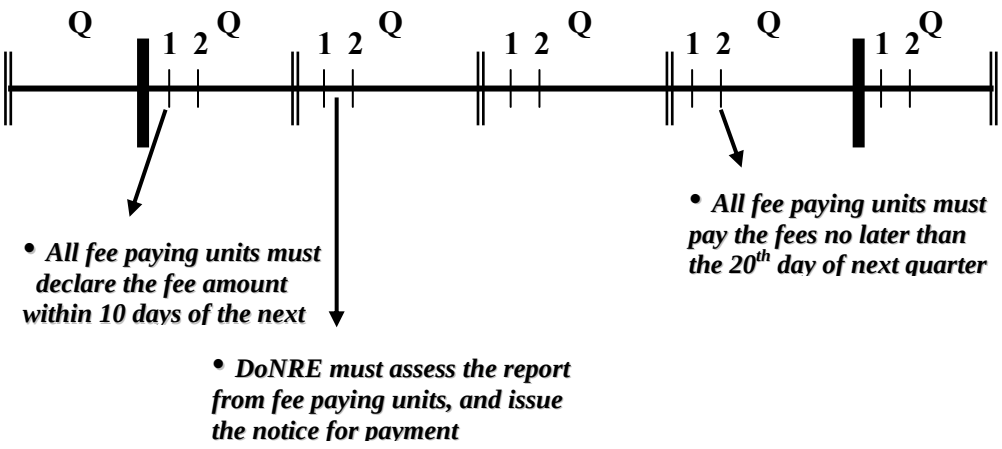
Table 1. Fee rates for the different parameters of industrial wastewater.

No.	***Pollutant***		***Charge rates (VND/kg of pollutant)***			
		Symbol	***Absorbing Env. A***	***Absorbing Env. B***	***Absorbing Env. C***	***Absorbing Env. D***
1	Biological-chemical oxygen demand	A_{BOD}	300	250	200	100
2	Chemical oxygen demand	A_{COD}	300	250	200	100
3	Suspended solids	A_{TSS}	400	350	300	200
4	Mercury	A_{Hg}	20,000,000	18,000,000	15,000,000	10,000,000
5	Lead	A_{Pb}	500,000	450,000	400,000	300,000
6	Arsenic	A_{As}	1,000,000	900,000	800,000	600,000
7	Cadmium	A_{BOD}	1,000,000	900,000	800,000	600,000

[8] Special cities, urban area types I, II, III, IV, and V are as defined in the Decree No. 72/2001/ND-CP of October 5, 2001 on the municipal categorization and municipal management levels.

Source: Circular 125

Collection and payment regulations. Collecting environmental protection fees on industrial wastewater is carried out following three main steps as described in Figure 2:



Source: Adopted from Laplante (2006b)

Figure 2. Main steps involved in the collection of environmental protection fees on industrial wastewater: self-reporting, assessment, invoicing, and payment.

- *Self-declaration of the fee:* Industrial enterprises have the duty to declare the fees that they must pay for the last quarter to the DONRE within the first 10 days of the next quarter.

- *Appraisal of the self-declaration and specifying the sum of fees:* DoNRE has the duty to appraise the declaration form submitted by the industrial enterprises, announce the amount of fees to be paid, and the terms of payment.

- *Payment of fees:* Enterprises must pay in full their fees in due course (following the announcement of DoNRE) to the account of the environment protection fees for wastewater in the local department of the State Treasury within 20 first days of the next quarter.

Control and use of the collected fees. The Circular indicates the following guidelines regarding the collected fees on industrial wastewater: 20 percent of the total is retained with DONRE to pay for expenses incurred in the collection and assessment as well as analysis of wastewater sample (periodic and random tests). The rest (80%) is remitted to the National Budget with the following distribution: 50 percent to the Central Government Budget (for the Vietnam Environment Protection Fund) and 50 percent to

the local budget (for environmental protection activities in the local area such as preventing, repairing and solving pollution; addressing degradation and environmental breakdown; investing in infrastructure; dredging ditches, and repairing and maintaining the local sewage system).

The contents of *Decree 67* and *Circular 125* are quite clear and understandable. However, they still have considerable shortcomings that are partly responsible for the difficulty in their implementation. A review by Laplante (2006b) of the implementation of *Decree 67* on environmental protection charges for wastewater in Vietnam indicates that at least two issues need to be considered.

First is time constraint. The entire procedure for payment must happen within 20 days following the end of the quarter being reported, from the calculation of pollution amount, submission and assessment of the report by the enterprises, to invoice issuance by the local DoNRE and finally payment by the industrial facilities. In reality, few DoNREs, if any, are currently capable of implementing all of these activities under such a tight schedule, especially since communication and transactions between the regulated facilities and local DoNREs are carried out face-to-face or by mail. Figure 3 shows a sample of an appraised environmental declaration by Hanoi DONRE. The quality of wastewater sample and amount of wastewater discharged had been kept constant over time. The EPFIW covered only COD and TSS, and the payment was made on an annual basis instead of quarterly.

The second issue pertains to the calculation itself of the pollution amount. This has proved to be a most difficult issue. Most DoNRE officials have strongly expressed experiencing difficulties in implementing *Decree 67* due to difficulty in calculating pollution emission. As a result, MoNRE is now drafting a circular to provide clear calculation guidelines. The draft circular indicates that the pollution loads are to be calculated based on the effluence coefficients of the different industrial products, depending on the raw materials and technologies used. It cautions that one should be careful not to overestimate the impact of using pollution coefficient since it may typically significantly reduce the incentives for pollution control, a key objective of *Decree 67*.

HANOI DEPARTMENT OF ENVIRONMENT, NATURAL RESOURCES & HOUSING (HANOI DONRE)

APPRAISED ENVIRONMENTAL REPORT ON EPFIW

Company: XXXX
Address: YYYY

Sector

Quarter	Parameter	V(m3)	C(mg/L)	F(VND/kg)	/1000	Amount to be paid
1st Quarter	BOD	31,200	208	300		1946880
	TSS	31,200	219	400		2733120
	Hg			20,000,000		0
	Pb			500,000		0
	As			1,000,000		0
	Cd			1,000,000		0
						4680000
2nd Quarter	BOD	31,200	208	300		1946880
	TSS	31,200	219	400		2733120
	Hg			20,000,000		0
	Pb			500,000		0
	As			1,000,000		0
	Cd			1,000,000		0
						4680000
3rd Quarter	COD	31,200	208	300		1946880
	TSS	31,200	219	400		2733120
	Hg			20,000,000		0
	Pb			500,000		0
	As			1,000,000		0
	Cd			1,000,000		0
						4680000
4th Quarter	BOD	31,200	208	300		1946880
	TSS	31,200	219	400		2733120
	Hg			20,000,000		0
	Pb			500,000		0
	As			1,000,000		0
	Cd			1,000,000		0
						4680000
Total amount to be paid for the year						**18720000**

Note: The resuls were calculated based on environmental monitoring data of DONRE

Head of Environment Protection and Meteology Dept. ***Inspector***

Source: Hanoi DoNRE

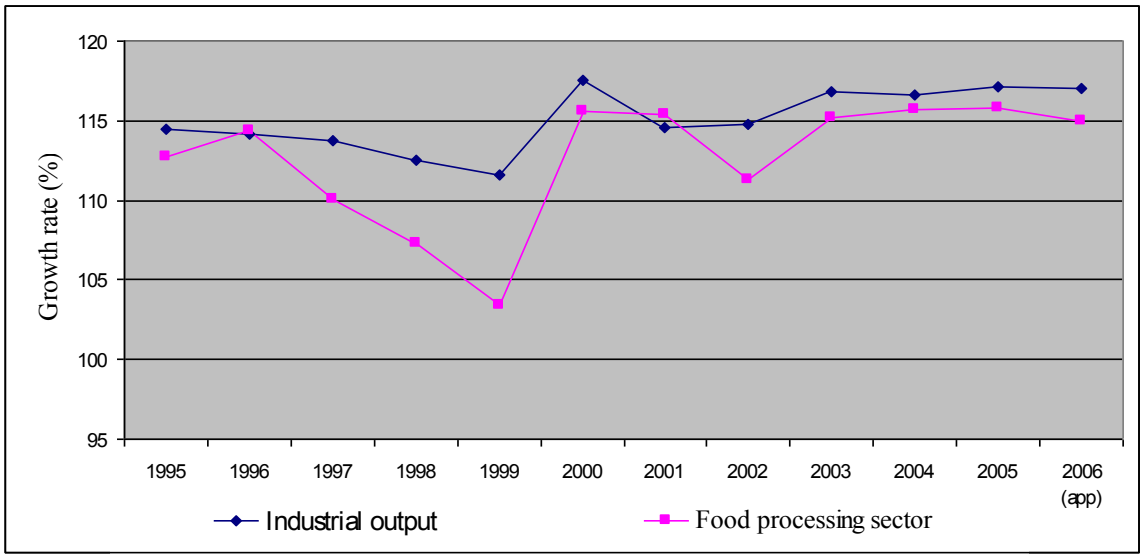
Figure 3. A sample of an appraised environmental declaration.

4. IMPLEMENTATION OF DECREE 67 IN THE FOOD PROCESSING INDUSTRY

4.1. Overview of the food processing industry

4.1.1. Role of food processing industry in Vietnamese economy

The food processing sector is a large and rapidly growing industry in the Vietnamese economy. The value added in the food processing sector in 2005 is estimated to be about US$2 billion, representing about 4 percent of GDP and 21 percent of agricultural value added (Chau 2005). The contribution of the industry to GDP appears to be growing. In 1991, food processing represented 6.7 percent of GDP; over the period 1991-2007, value added in this sector grew 14 percent annually while GDP grew only 7.5 percent (Ohno 2008). Furthermore, the growth of the food processing sector outpaced by a small margin that of the industrial sector in general in 1996 and 2001 (Fig.4).



Source: Statistical Year Book of Vietnam (2006)

Figure 4. Industrial output growth rate (at constant 1994 prices).

In 2004, the food processing industry employed 408,413 workers (Table 2), accounting for about 14.4 percent of the total labor force and making it the third ranking industry in Vietnam in terms of employment. These employees work in 4,482 companies. Most of these companies are located in Hanoi and HCMC. About 7 percent of the food processing factories are located in Hanoi, 13 percent in HCMC, and the rest are spread in 62 cities and provinces of Vietnam (Statistical Year Book of Vietnam, 2004).

Table 2. Food processing industry in Vietnam (2004).

Location	*Number of firms*		*Number of employees*		*Total output (in VND million)*	
	N	%	N	%	N	%
Hanoi	316	7	14,881	4	253,576	4
Ho Chi Minh City	559	13	67,579	17	1,643,567	21
Vietnam	4,482	100	408,413	100	6,032,809	100

Source: Statistical Year Book of Vietnam (2004)

In terms of ownership, the industry is participated in by the state sector, non-state sector, and foreign-owned enterprises. Although the state is still the dominant player, the private sector is taking on an increasingly important role. The private sector, including companies with foreign investments, now accounts for 49 percent of total food processing outputs in Vietnam.

The food processing industry also plays an important role in Vietnam's exports. Agricultural, fishery, and forest products, almost all of which are processed in some way before being exported, account for US$3.2 billion in exports, or 36.8 percent of total exports. In the food processing sector, seafood is among the most important export items of Vietnam (Table 3). Currently, aqua products rank fourth among Vietnam's export items after oil and gas, textile and garment, and foot wear. Total export turnover from seafood products in 2005 was US$2.7 billion or 8.4 percent of the total national export value and 5.7 percent of the GDP (Vietnam Economic Times 2006).

Table 3. Contribution of aquatic products to exports (in million US$).

		Export of aquatic product	
Year	*Total export*	*Export value*	*Share in total export (%)*
2000	14482.7	1478.5	10.2
2002	16706.1	2021.7	12.1
2003	20149.3	2199.6	10.9
2004	26485	2408.1	9.1
2005	32447.1	2732.5	8.4
2006	39826.2	3358.1	8.4
2007	48,561,4	3763.3	7.8

Source: Statistical Year Book of Vietnam (2007)

The liberalization of Vietnam's economy and world trade and the rising consumer prosperity have opened up new opportunities for development of the country in general

and diversification in the food processing sector in particular. A number of recent studies have revealed that there is tremendous potential in Vietnam to build a profitable business in the food processing sector. Vietnam's accession to APEC, ASEAN, AFTA, and especially WTO in 2006 facilitated its integration in the world economy. During the period from 1998 to 2007, Vietnam's exports have increased by 18.5 percent annually. Exports in 2007 reached USD 48,6 billion, 23 times more than 1991 and 9 times than 1995 (Statistical Year Book of Vietnam 2007). The export base also shifted from primary commodities to manufactured goods such as electronics, garment, food products, and footwear. The ratio of manufacture export to total export, which hovered around 28 percent in the second half of 1980s, increased to approximately 50 percent by 2007.

From being a closed economy, Vietnam now has established trade relations with over 100 countries worldwide. Vietnam's processed food products are also presented in 105 countries, mainly in Japan, EU, USA, and China. Earnings from these markets account for more than 65 percent of the total food product export value in 2006. The industry has started producing many new items like ready-to-eat food, different kinds of beverages, processed and frozen fruit and vegetable products, and marine and meat products. Vietnamese consumers are being fast introduced to new high quality food products made using the latest state-of-the-art technology, which also gives the industry a competitive edge.

4.1.2. Environmental problems caused by the food processing industry

The significant contribution of the food processing industry to Vietnam's economic development has been much appreciated. However, with the rapid growth of the industry came environmental deterioration, putting stress on the country's natural resources. These environmental problems may affect also the prospects of industrial growth of the whole country in the future.

The food processing sector in Vietnam includes dairy product manufacturing, meat and seafood processing, beverage manufacturing, and fruits and vegetables processing.

The dairy industry includes plants that process milk to produce cheese, butter, bottled milk, ice cream, and dried milk or whey. Cleaning and sanitizing the processing equipment generate significant volumes of wastewater that must be properly treated prior to being discharged.

The meat industry includes facilities that process cows, hogs, calves, ducks, turkeys, chickens, and fish. The environmental issues here are mainly the management of wastewater and the inedible animal parts.

Beverage manufacturing involves mixing spirits and soft drink and filling cans, bottles or kegs. Its major pollutants are wastewater and gases from combustion.

Regarding fruits and vegetables, the major commodities processed are snap beans, sweet corn, peas, potatoes, cabbage, cucumbers, cranberries, cherries, and apples. Appropriate

management of the inedible parts (e.g., corn cobs and husks, potato peelings) is an environmental concern for this sector.

The rapid development of Vietnam's food processing industry has so far resulted in three environmental issues: (1) discharge of untreated wastewater, (2) intensive water consumption, and (3) improper solid waste management. Minor problems such as increased electric/energy consumption as well as noise and odor generation are also associated with food processing activities.

Wastewater is the top source of pollution. Food processing generates significant volumes of wastewater from cleaning and sterilizing equipment as well as washing and cooling the products. It is often not practical to recycle or reuse wastewater because of the need to meet strict sanitation standards demanded by consumers and required by regulations.

The pollutants in the wastewater are biodegradable organic material, (measured as biochemical oxygen demand or BOD), nitrogen in several chemical forms, phosphorus, and chloride (Table 4). Prior to discharging wastewater to a lake or stream, it must go through a biological treatment process to remove pollutants or convert them to non-polluting chemical forms.

Phosphorus: Phosphorus is used in many food products. It is also an ingredient in industrial strength cleaners. For example, the dairy sector uses phosphoric acid in cleaning pipelines, storage tanks, and processing equipment. Best management practices include minimizing product loss to the sewer, choosing a substitute for high phosphorus cleaning chemicals, and checking the composition of all processing materials to minimize the loss of products with high phosphorus.

Chlorides: Chloride ions in significant concentrations can be toxic to aquatic life. They cannot be removed by any conventional wastewater treatment process. One significant source of chlorides is the waste of sodium chloride used to salt food products. Cheese is salted by spreading salt on the curds or dipping cheese blocks in brine tanks. Pollution prevention actions include precise application of salt to the curds, minimizing spills and drips when cheese blocks are lifted out of brine tanks, and using brine as long as possible by filtering and sterilizing. High strength brine is used in processing cabbage into sauerkraut and cucumbers into pickles. Minimizing spills when moving products in and out of the processing tanks and reuse of brine by filtering and sterilization by heat are recommended practices.

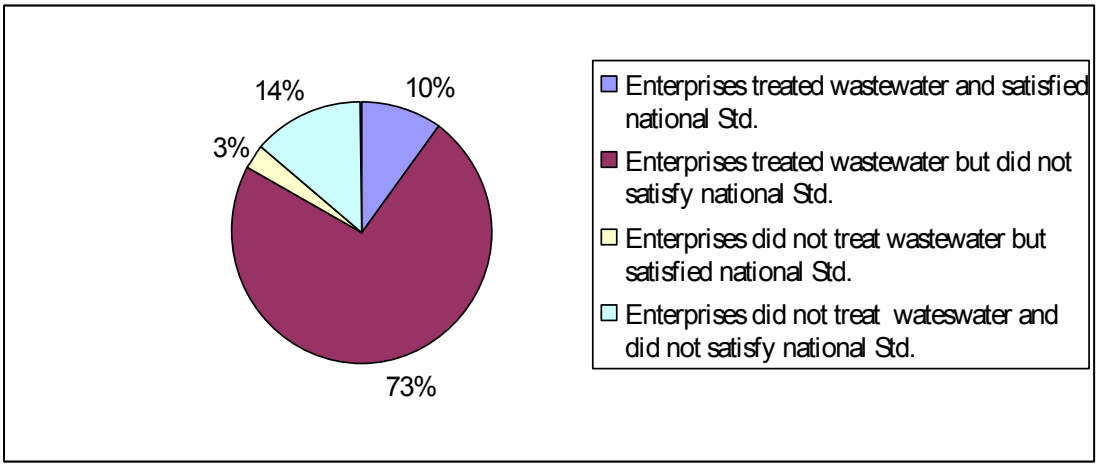
Table 4. Characteristics of wastewater of selected food processing factories (2004).

Parameter	Brewery factory	Beverage factory	Sea food factory	TCVN (5945-1995) class B
pH	5.7 –11,7	5.4 – 8.3	6.5 –7.5	5.5-9
BOD_5 (g/m^3)	750 – 2,500	50 – 200	800 – 1,000	50
COD (g/m^3)	1,200 – 4,700	100 – 1,400	900 – 1,300	100

N total (g/m^3)	20 – 190		130 – 170	
P total (g/m^3)	2 – 18		15 – 40	6
SS (g/m^3)	300 – 7,000	30 – 100	80 – 170	100

Source: Hanoi DoNRE Internal Report (2004)

Another feature of the food processing industry in Vietnam is that the majority of factories were established a long time ago, when environmental considerations were not yet in place. Except for some new foreign-invested factories that have relatively modern technology with environmental protection measures, most factories in this sector have poor technology and equipment. According to a survey conducted by the Ministry of Industry in 1999, only 10 percent of 105 food processing industries have wastewater treatment equipment that ensures wastewater quality at acceptable standards (Fig. 5). This is seen as the main reason for the serious environmental impact of this sector on water bodies.



Source: Ministry of Industry, Internal Report (2000)

Figure 5. Current environmental wastewater treatment status of food processing industry (1999).

4.2. Implementation of Decree 67

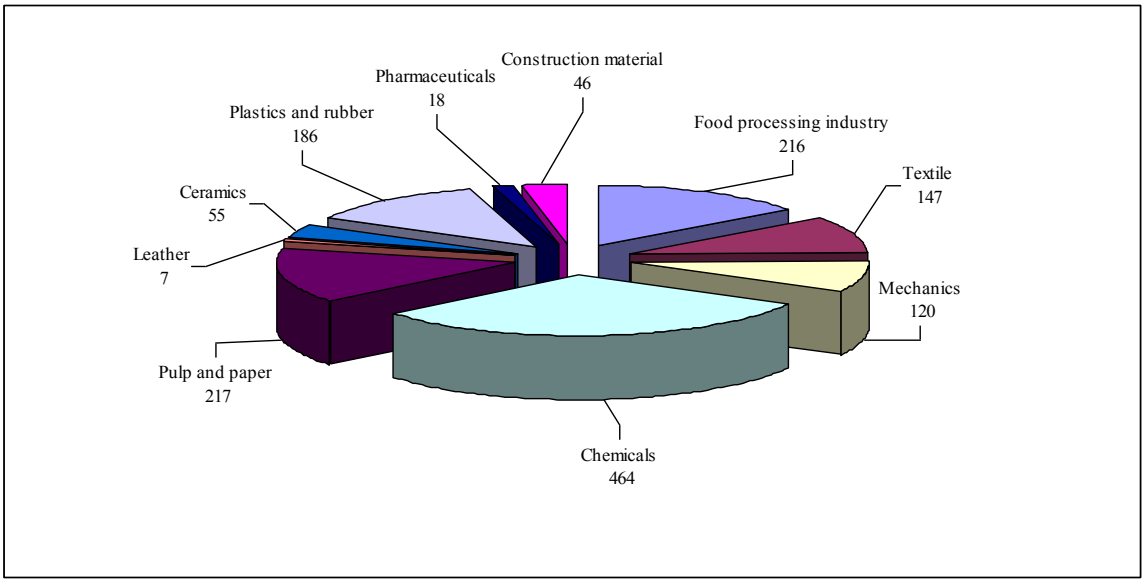
4.2.1. Implementation of Decree 67 in Hanoi

Wastewater fee was first introduced in Hanoi in May 2004. The implementation of *Decree 67* in Hanoi was five months later than in the other provinces like HCMC, Binh Duong, and Quang Ninh. Those cities/provinces are among the pioneers in implementating wastewater fees. Hanoi, the capital of Vietnam, belongs to the group of provinces where the program has been implemented with big delay. Moreover, in Hanoi, BOD was excluded from the list of pollutants while in HCMC and the other provinces,

industrial wastewater fees are imposed on seven pollutants, which include BOD. The main reason for BOD's exclusion is that BOD and COD parameters are identical.

According to statistical data provided by Hanoi DoI, Hanoi has more than 20,000 enterprises, of which 1,386 firms belong to the category of large and medium size. These establishments are considered as potentially polluting industries that can be covered by *Decree 67*.

Figure 6 shows that firms engaged in chemicals, pulp and paper, and food processing mostly compose the list of most polluting firms. They are followed by firms engaged in plastics and rubber, textile, mechanics, and others.



Source: Hanoi DoI (2004)

Figure 6. Classification and number of firms in Hanoi's industrial sector.

As of October 2006, only 33 percent of the potentially highly polluting firms in Hanoi were covered by wastewater fees. That is, only 453 firms received written notices from DoNRE on the amount of wastewater fees to be paid (Table 5). Of these, only 98 firms made a transfer to the state budget.

Table 5. Payment of wastewater fees by firms in Hanoi.

		Year 2004	Year 2005	Year 2006 (first 3 quarters)
1	Firms that received written notices from Hanoi DoNRE on the amount of wastewater fees to be paid	453	453	453
2	Firms that paid wastewater fees	76	28	23
3	Firms that did not pay wastewater fees	364	378	398

4	Total assessed fees (VND)	689,040,733	610,040,733	414,020,592
5	Total collected fees (VND)	683,611,214	249,349,661	62,635,654
6	Rate of collection efficiency (%)	99.2	24.8	15.3
7	Average fees paid by firms (VND)	8,994,884	8,905,345	2,723,289

Source: Hanoi DoNRE Internal Report (2006)

During the first three years of implementing Decree 67, the ratio of actual collection to total assessed fees (or collection efficiency) was only 58 percent. The highest rate was recorded in 2004, which was the first year of implementation. From then on, there has been a decreasing trend in both total and average fees paid by industrial firms in Hanoi.

Across subsectors, the food processing industry accounts for the most wastewater fees paid (Table 6). Over the period 2004-2006, it accounted for 52 percent of the total fees collected. Within the food processing subsector, the same declining trend in total and average wastewater fees paid is observed. After three years of implementation, the maximum amount of fees paid by a firm in this sector dropped by 22 times; the average amount of fees paid dropped by 8 times.

Table 6. Amount of wastewater fees paid by the food processing industry in Hanoi.

		Year 2004	**Year 2005**	**Year 2006 (first 3 quarters)**
1	Total fees paid by all sectors (VND)	683,611,214	249,349,661	62,635,654
2	Amount of fees paid by food processing industry (VND)	426,514,078	65,720,682	26,936,059
3	Contribution of food processing industry (%)	62	26	43
4	Average fee paid by food processing firms (VND)	53,314,259	10,953,447	6,734,014

Source: Hanoi DoNRE Internal Report (2006)

On one hand, it is possible that the declining trend in the average fee paid by industrial firms in general and firms in the food processing industry in particular reflects a decreasing trend also in pollution loads since the fees are based on the level of pollutants in the wastewater. The declining trend in total fees paid thus could indicate the effectiveness of *Decree 67* in inducing a change in the firms' environmental performance. For example, as a result of *Decree 67*, a brewery, liquor, and beverage company installed in 2005 a wastewater treatment plant, which resulted in a more than 90 percent reduction of total wastewater fees paid by the firm (from VND 363 million to less than VND 35 million).

On the other hand, the declining trend may imply weaknesses in the implementation of the environmental regulations. It is the general understanding of researchers and government officials that the implementation of wastewater discharge fees in Vietnam in general and in Hanoi in particular has not been very effective. The main reasons are: (1)

absence of a clear direction and methodology, (2) lack of capacity at local levels[9], and (3) existence of some confusions in the calculation, collection, and assessment process as described in the previous chapter.

4.2.2. Implementation of Decree 67 in HCMC

Decree 67 was introduced to HCMC in January 2004. HCMC is among the pioneers in implementing *Decree 67*. The charging of environmental protection fees has received attention from policymakers and environmental officers in HCMC to make it concrete and effective[10]. A manual for implementing *Decree 67* was developed by HCMC DONRE since early 2004. Many training courses and seminars on the wastewater fees program had been conducted for industrial companies in HCMC.

Like many other provinces and cities in Vietnam, the industrial wastewater levy system in HCMC covers seven pollutants, namely: BOD, COD, TSS, mercury, lead, arsenic, and cadmium. Fee calculation and collection are addressed in Articles 10 and 11 of *Decree 67*, and made considerably more explicit in Section IV of Circular 125 (Appendices 1 and 2).

Unlike Hanoi, there has been an increasing trend in both total and average fees paid by industrial firms in HCMC during the first three years of implementing *Decree 67*.

The increasing trend in average fees paid by industrial firms in particular and total fees collected in general may reflect the increasing efforts of local environmental officers in implementing *Decree 67*. On the other hand, it could imply the adverse impacts of *Decree 67* on the firms' behavior in terms of pollution generation.

As of July 2007, the total industrial wastewater fee collected in HCMC is VND13,427,097,780 (Table 7), which is 11 times more than total fees collected in Hanoi. The coverage of *Decree 67* was limited to 3,574 firms, representing about 13 percent of total firms in HCMC.

[9] Hanoi DoNRE's Environmental Division has only 15 officials, three of whom work as technical officers and deal with the wastewater fee collectors at the same time.

[10] Only HCMC DoNRE has an Environmental Protection Division, which has 15 staff members. This Division is responsible for control and inspection activities and for emission charge collection.

Table 7. Payment of wastewater fees by firms in HCMC[11].

		Year 2004	Year 2005	Year 2006	Year 2007 (first 2 quarters)
2	Firms that paid wastewater fees	129	1851	1594	362
2	Total collected fees (VND)	294,929,541	4,716,455,486	6,054,465,653	2,361,247,100
3	Average fee paid by firms (VND)	2,286,276	2,548,058	3,798,285	6,522,782

Source: HCMC DoNRE Internal Report (2006)

This coverage is about 30 times higher than that in Hanoi. Firms in HCMC on average paid about VND3,096,208 for EPFIW, which is almost 40 percent higher than that paid by Hanoi firms. More information on the implementation of *Decree 67* in Hanoi and HCMC is given in Table 8.

Table 8. Implementation of *Decree 67* on EPFIW: Hanoi vs. HCMC.

	Hanoi	HCMC
Starting time	May 2004	January 2004
Pollution parameters	6 (excl. BOD)	7
Supporting materials	Decree 67; Circular 125; Simple software	Decree 67; Circular 125; Manual for implementation
Organization responsible for implementing Decree 67	Env. Division (DONRE HN), water supply companies, IP/IZ Management Board	Env. Protection Division (DONRE HCMC), water supply companies, IP/IZ Management Board
Number of staff involved in Env. Division	3	15
Total firms that should pay the fees	More than 20,000	More than 30,000
Total firms that pay the fees	127	3574
Total collected fees, 2004-2006 (VND)	995,596,529	11,065,850,683
Average fees paid by firms (VND)	7,939,342	3,096,208

[11] In HCMC, data on contribution of the different industrial sectors to total wastewater fees collected are not available. DoNRE HCMC does not track basic information on the number of companies registered in HCMC. The data from different government agencies may not be compatible (records of the number of businesses operating does not distinguish between firms that may or may not be subject to environmental regulations). Moreover, there are cases where firm has its main office in HCMC but its plants are located in several regions.

4.3. Survey results

The survey aimed to assess the motivations, practices, and opportunities for improvement of the firms' environmental performance. More importantly, the interviews were conducted to investigate how firms really perceived the impact of environmental regulations on their environmental performance.

Regarding the attitude of firms toward environmental protection, it was assumed that their behavior would be affected by internal factors such as the firm's size, subsector, type of ownership; institutional factors such as regulations and their enforcement, environmental management policy instruments; and external factors such as community pressure and market forces like consumer pressure or market share.

The above hypotheses were tested by undertaking a survey of 119 food processing companies in Hanoi and HCMC.

4.3.1. Profile of the sample firms

The survey targeted 150 firms in the food processing industry in Hanoi and HCMC. However, as of 1 September 2007, only 119 firms had responded to the survey, among them 55 firms located in Hanoi and 64 firms in HCMC.

The survey was intended for firm managers, supervisors, and environmental officers as they are in the best position to talk about the firms' perceptions on the impact of *Decree 67* and other factors affecting their environmental performance. However, none of the interviewed establishments had a particular department/unit/person responsible for environmental management. Of the 119 companies interviewed, only 59 firms had a technician working in the technical or quality control departments and dealing with the environmental problems at the same time.

In this survey, a food processing company is understood to be a firm that operates in the brewery, beverages, milk and sugar, seafood, noodle, and confectionery sectors. Figure 7 shows that firms engaged in the seafood subsector topped the list of the sample respondents (39%), followed by confectionery (26%) and beverages (23%). The rest were companies in milk & sugar (7%) and noodle (5%) subsectors.

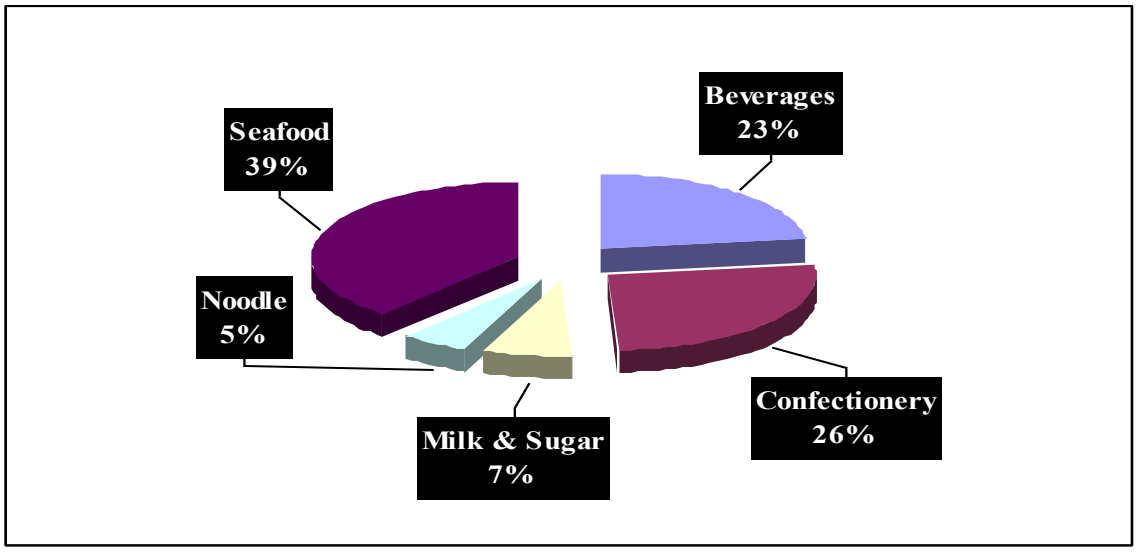


Figure 7. Distribution of surveyed firms by industrial subsectors.

In terms of ownership, the firms are classified into four categories: state, joint-stock, FDI, and private. Of surveyed companies, 63 are joint-stock, 26 are private owned, 24 are state, and 6 are FDI companies (Table 9).

Table 9. Classification of the surveyed firms by type of ownership.

	Type of ownership	Number of firms	% of total
1	State	24	20
2	Private	26	22
3	Joint-Stock	63	53
4	FDI	6	5
	Total	**119**	**100**

More details on the profiles of the surveyed companies are provided below.

Location. Ninety-one percent of the visited food processing companies were located within residential areas of HCMC and Hanoi; only 9 percent were located in industrial parks or industrial zones (IP/IZ) of HCMC (Table 10). None of the surveyed companies in Hanoi was located in an IP/IZ. They were located in districts considered to be not very central,although some were quite close to the central districts, only 3-5 km from the city center. Others were in the peri-urban districts, which are 10-30 km from the city.

Table 10. Distribution of firms according to location and number of employees.

		Number of firms	% of total
1	Location		
	Hanoi	55	46
	HCMC	64	54
2	Employment		
	Fewer than 300 workers	74	62
	300-1000	32	27
	More than 1000	13	11
	Total	**119**	**100**

Labor. Sixty-two percent of the interviewed companies can be classified as small and medium sized in terms of number of employees[12]. The number of workers varied from 10 to 1,500 persons. Of the 119 companies, 11 percent employed more than 1,000 workers. The companies used local labor. Depending on the specific work and experience, workers at food processing companies usually earn from VND1,000,000 to 1,500,000 per month, which is similar to the average salaries in the other industrial sectors and just enough to cover the basic living expenses. In some companies, the highly educated employees are paid from VND3,500,000 to 8,000,000 per month, depending on their experience.

Volume of wastewater. Because most of the water consumed by the processing plants (except for brewery and beverage factories) is subsequently converted into wastewater, a large amount of wastewater is generated. The 119 sample firms had an average wastewater discharge of 211m^3 per day. They can be divided into three groups according to volume of wastewater generated: less than 30, 30-150 m^3/day, and more than 150m^3/day[13] (Table 11).

Table 11. Firm classification by volume of wastewater discharge.

	Wastewater discharge (m^3/day)	Number of firms	% of total
1	Less than 30	20	17
2	30-150	52	44
3	More than 150	47	39
	Total	**119**	**100**

Source: Author's survey

[12] In Vietnam, small and medium companies are defined as companies with less than VND10 billion in paid-up capital and fewer than 300 employees.

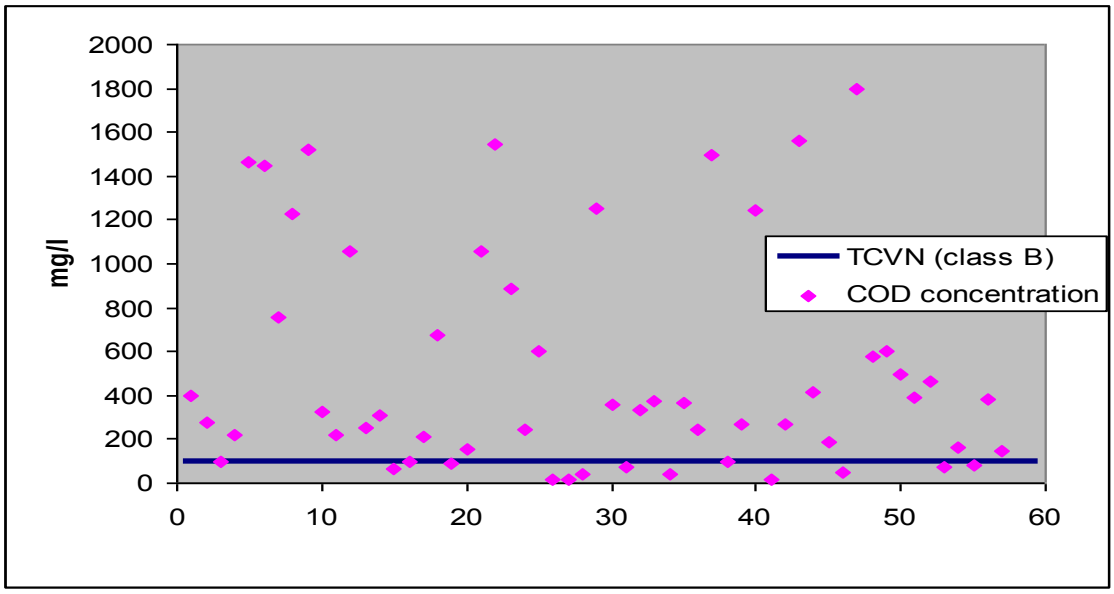
[13] This is the author's classification based on the Philippines' experiences. Companies with a volume of wastewater discharge of less than 30m^3/day are regarded as small enterprises, those with 30-150m^3/day capacity as medium-size enterprises, and those above 30-150m^3/day as large enterprises.

Table 11 shows a dominance of small and medium firms (61% combined), compared with large firms (39%).

4.3.2. Current status of wastewater pollution

Among the surveyed firms, only 59 companies recorded the quality of their wastewater. Figure 8 clearly shows that their wastewater contained high organic contents. Among them, only 14 firms met the environmental standards requirements TCVN 5945-1995 class B[14] for COD; 34 firms had a TSS concentration lower than the permitted standard class B. Most of the firms had recorded levels of COD or TSS concentration above the permitted environmental norms. In the worst case, the pollutant concentration was about 18 times higher for COD and 14 times higher for TSS. None of the firms sampled had complied with class A environmental standard. Such wastewater if not properly managed or treated before being discharged threatens the quality of the receiving water body.

(a) COD concentration



(b) TSS concentration

[14] In accordance with the TCVN 5945-1995 on industrial wastewater, wastewater discharge standards are divided into 3 levels – *A, B,* and *C*. A permitted standard for BOD is less than 20 mg/l (A), less than 50mg/l (B) and less than 100mg/l (C); for COD it is less than 50 mg/l (A), less than 100 mg/l (B) and less than 400 mg/l (C); for TSS it is less than 50 mg/l (A), less than 100 mg/l (B) and less than 200 mg/l (C). Level *A* standards require the most extensive and sophisticated wastewater treatment, whereas Level *C* standards require minimal treatment. At present, industrial waste treatment facilities are expected to treat wastewater to at least Level *B* standards. Wastewater with pollutant level higher than C Level cannot be discharged.

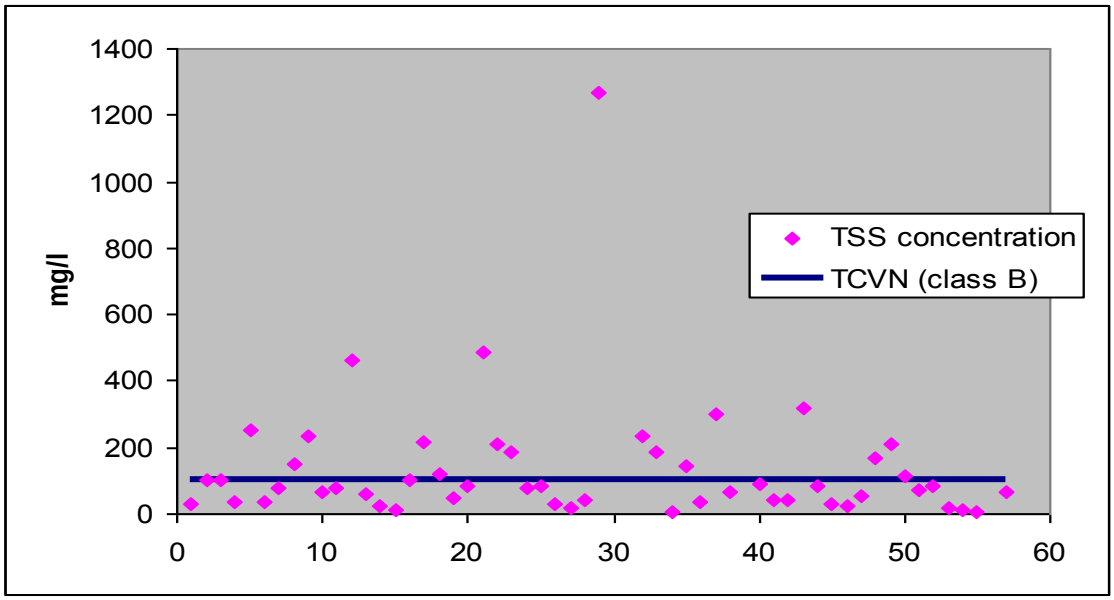


Figure 8. Wastewater pollutants' concentration of the surveyed companies.

The analysis of wastewater pollutants' concentration had been conducted as if all the surveyed companies belonged to one group. However, in reality, different companies have different characteristics and different environmental performance. A closer look at the average concentration of pollutants shows a number of interesting trends and evidence (Table 12).

Table 12. Relationship among locality, subsector, ownership, and status of wastewater pollution.

Subsector	**Beverages**	**Confectionery**	**Milk & Sugar**	**Noodle**	**Seafood**
Average COD conc.	396	715	164	639	485
Average TSS conc.	86	152	226	143	167
Type of ownership	**State**	**Private**	**JV**	**FDI**	
Average COD conc.	469	614	501	322	
Average TSS conc.	89	102	180	93	
Location	**Hanoi**	**HCMC**			
Average COD conc.	546	476			
Average TSS conc.	170	124			

Subsector. The pollution situation differs from one sector to another, depending on the type of products and industrial activities. In terms of sub-sectors, Table 12 shows that confectionery registered the highest level in average COD concentration, followed by noodle and seafood subsectors. The best environmental performer appears to be milk and sugar companies, whose average COD concentration is 164 mg/l only.

Ownership. It is observed that companies partly or wholly owned by foreign investors have a better environmental performance than state, JSC, and private companies in terms of both COD and TSS concentrations.

Location. Environmental performance appears to vary also according to locality. On average, firms in Hanoi have a higher concentration of COD and TSS in wastewater than firms in HCMC. Such difference may be a reflection of the role that local governments play in enforcing environmental regulations.

4.3.3. Environmental awareness of the surveyed firms

Environmental protection is the responsibility of not only relevant official agencies but of the whole society. As environmental problems have complex and interrelated spatial and temporal dimensions, they and their solutions should receive more attention and participation of all stakeholders especially enterprises. Commercial enterprises, which play the main role in economic development, should be responsible for a large part of the environment problem. They should simultaneously pursue the goal of running successful businesses and making profits and at the same time meeting the society's demand for a clean environment. For most enterprises and their managers, however, the profit motive is often the primary concern to be achieved by any means.

Table 13 shows the percentage distribution of firms that responded to the question on the environmental situation of the company. Almost all (87%) the interviewed companies indicated that their current environmental performance had become better compared with the status in 2004; 18 percent believed they have outstanding environmental performance and 18 percent considered environment as an issue of high priority.

Table 13. Firms' environmental self-assessment.

	Responses (%)			
	Much better	**Better**	**Same**	**Less**
How do you rate your present environmental performance compared with 2004?	26	61	13	0
	Outstanding	**Very good**	**Good**	**Not bad**
What do you believe to be your current environmental performance?	18	39	35	8
	Strongly Agree	**Agree**	**Neutral**	**Disagree**
CEOs of your company have committed to environmental improvement.	18	79	3	0

In responding to the questions on environmental problems associated with the companies' activities, most of the respondents acknowledged that their production processes created various pollutants to the environment (e.g, wastewater, smell, noise and solid wastes). Although showing concern about their environmental problems, none of

interviewed establishments had a particular department responsible for environmental management. Of the 119 companies interviewed, 59 firms who recorded the quality of their wastewater have a technician working in the technical department and dealing with the environmental problems at the same time. The extra responsibility added very little or no money to his/her regular salary. It is understandable that for small and medium size companies, one way to reduce the overhead cost is to keep a minimum level of apparatus and number of employees. When asked about environmental management, the „manager/owner' of a private confectionery company in HCMC smiled and said:

> *"I am working as manager, technician, and accountant at the same time. If you want, from now on call me environmental manager."*

Meanwhile the big state-owned companies said the reason they do not have a particular staff for the environmental issues is they are not required to have one.

Among the visited companies, 24 companies have installed wastewater treatment facilities. The investment cost varied from VND40 million to VND1 billion. The interviews revealed that while the companies had some kind of wastewater treatment, the treatment's effectiveness was low. This fact is consistent with the data provided by DoSTE Hanoi and HCMC on the effectiveness of wastewater treatment system of food processing factories. As such, most treated wastewater did not satisfy TCVN class B. The survey revealed three main reasons for the low quality of wastewater treatment facilities:

> (1) Lack of deep knowledge of environmental protection. The installation of waste treatment system in some firms was done based on the firm managers' perception of the presence of pollutants in wastewater. Such decision should have been based on the technical parameters and analysis.
>
> (2) Low quality of workers. Most employees operating the treatment systems do not have the right expertise. Some companies assigned technical workers (e.g., electrical, mechanical workers) to operate the system.
>
> (3) Low capacity of the wastewater treatment facility compared with the production capacity

Among companies establishing new factories in IP/IZ, full compliance with the environmental standards remains elusive. As one firm manager said:

> *"Our environmental performance this year is better than last year. We have just installed a new wastewater treatment system, which costs more than one billion VND. But I'm not so sure if it can meet any Vietnamese standards for industrial wastewater."*

A similar sentiment was expressed by the owners of two other companies who said they have no idea about the quality of installed wastewater treatment systems.

One way to finance the installation of wastewater treatment facility is through self financing. Joint-venture and private firms do not have enough funds for such an investment. The study found that 27 percent of the total investment cost was covered by the company budget; the remaining 63 percent came from external financial sources, especially commercial loans (Table 14). Regarding the soft loan provided by the Environmental Protection Fund, 30 percent of the companies expressed their interest in such program. On the other hand, 70 percent of the firms said they do not borrow money from the Government or Environmental Protection Fund, even if these charge lower interest rates and their companies are eligible, because of the complicated loan procedures. Said one respondent: *"A low interest rate is always nice. However, a treatment facility is an investment of no return. We do not have enough time, relations, and ...efforts to borrow money from the Government."*

Table 14. Financial sources of wastewater treatment facilities.

Source of finance	Company budget	Commercial loans	Soft environmental loans
% in total	27%	63%	0

One question is whether having a treatment facility is really costly. If so, why do some firms still invest in it? All of the interviewed firms worried about the future of their businesses since they were polluting and thus subject to warnings and fines or even being shutdown. In interviews with directors/managers of beverages companies in HCMC, they conceded: *"We just want to survive and to run our business. We don't want to have any extra problems including environmental. That's why we installed a wastewater treatment system."*

While this could indicate an improved sense of environmental awareness among managers, it also underscores a lack of determination and commitment for a long-term environmental strategy. They comply with having a wastewater treatment facility to avoid inspection from relevant organizations.

In summary, the results of the interviews indicate that knowledge of environmental protection and allocation of responsibility appear to be ambiguous and insufficient among enterprise owners and managers. For most enterprises and their managers, the profit motive is still the primary concern to be achieved by any means

4.3.4. Pressure for pollution control activities as perceived by firms

One of the objectives of the study is to look into determinants of environmental behavior of the firms. What are the sources of pressure experienced by the firms thus affecting their environmental performance? While the number of firms surveyed is small, the results could provide some useful information on the firms' environmental attitude.

The survey contained questions on the regulations, inspection, and complaints to which polluting firms are usually exposed. It was expected that regulations prevent industrial firms from having a poor attitude toward the environment. This is because through regulations, firms are forced to operate in a way that does not adversely affect the environment beyond a certain level.

The survey results show that government (national regulations) was the most influential factor affecting the attitude of firms in the food processing industry toward the environment (Table 15). All of the interviewed firms indicated that environmental regulations were the most important factor behind a firm's decision to introduce environmental policies.

Table 15. Sources of pressure as perceived by firms' managers (in %).

Source	1st source	2nd source	3rd sources
Government (national regulations)	100	0	0
Suppliers	0	0	0
Customer	0	38	43
Community commitment	0	31	45
Regulation - Wastewater fees	0	7	8
Participation in special program	0	6	4
Others	0	17	0

The expected effect of regulations on the firms' attitude is supported through regulation enforcement. From the national level, regulations are enforced mainly through inspections by MoNRE and related ministries like the Ministry of Health and Ministry of Construction. At the city and provincial level, this duty lies with the provincial DoNRE, Department of Health, and Department of Construction. Firms located in Hanoi and HCMC are under the coverage of the provincial departments. The inspection can be classified as regular/annual and irregular/random. The annual/regular inspection from DoNRE is the most important. The schedule of the regular inspection is announced in advance.

All the interviewed firms had been inspected (1-4 four times in the past 3 years) by the different agencies. All the inspections were regular. Their violations were: air pollution (19%), water pollution (59%), absence of wastewater treatment facility (19%), and others (3%) (Table16). They were subsequently requested to improve their environmental performance by installing waste treatment equipment or systems and to pay the administrative fine. More than three quarters (76%) of the sample firms received violation notices in the past 3 years; 19 percent of them had paid fines for the same period.

Table 16. Environmental violations and anti-violation measures.

		% of total
1	Environmental violation	
	Wastewater pollution	59
	Air pollution	19
	Absent of wastewater treatment facility	19
	Others	3
2	Anti-violation measures	
	Notices	76
	Warning	6
	Fines/penalties	18
	Total	**100**

The survey found that inspections had no or very little effect on the behavior of food processing firms in Hanoi and HCMC. As Table 17 shows, the more number of inspections, the worse the environmental situation in terms of COD and TSS concentrations. Most of the interviewed firms worried about the impact of inspection on their production since they were polluting and subject to warning and fines or even shutdown. However, instead of improving their environmental performance, the firms made use of a way to lower the fines and escape legal sanction, for instance through grease money or the „envelope'[15]. The inspectors received the money and turned a blind eye to the pollution. This kind of collusive relationship is very dangerous since it encourages pollution. It is the reason why among the surveyed firms, 80 percent have not installed wastewater treatment facilities.

Table 17. Relationship between inspections and environmental performance.

Inspection			Average COD Concentration	Average TSS concentration
Times	N	%	(mg/l)	(mg/l)
Once	9	15	382	136
twice	12	20	571	163
3 times	35	59	317	95
4 times	3	5	934	212

Neither state nor private companies in Hanoi received ecological requirements from their foreign partners. This can be explained by the fact that the market share of their products

[15] It is a practice in Vietnam that people put money in an envelope as a gift to someone who can help or has helped them. It becomes an ominous social issue and considered as bribery.

is still small. Their products are largely sold in the domestic market where ecological products are not popular at all. The interviewed companies recognized that their products need to be environmentally friendly especially as they are trying to expand their market share and export to the international market. Nonetheless, they are still not sure about how to achieve it. This goal is still only in their company's plans.

The situation in HCMC is quite different. Food processing firms there target the international market. As of December 2005, the contribution of food products to HCMC's GDP was 2.3 percent. At present, the biggest challenge for Vietnam's exported food products is meeting the requirements on antibiotic content and chemical residuals set by EU and USA. Currently, many chemical and biological products are used in the various stages of culturing, processing, and preserving food products. The interviews revealed that compliance with environmental and hygienic standards is the pre-condition to the firms becoming successful exporters. About a third (30%) of the interviewed companies have applied and been acknowledged to comply with the HACCP standard (and thus allowed to export products to the USA and Japan); 11 percent have been granted the GMP certificate.

From the interviews, it can be concluded that the international market potentially has a significant impact on the firms' environmental performance. Products sold in foreign countries with strict environmental regulations, like the USA and EU markets, have to meet and anticipate these high standards. As such, the higher the firms' export capacity, the better their environmental performance.

Table 18. Relationship between HCMC firms' export activities and environmental performance.

	Export activities		**Average COD concentration**	**Average TSS concentration**
	N	%	(mg/l)	(mg/l)
YES	24	41	460	102
NO	35	59	548	176

Complaints from neighboring communities against the firms' pollution exist but these have been few because the main environmental impacts by these firms are not very visible. They discharge wastewater into the underground sewage system shared with residential areas. Wastewater then flows unnoticed to the nearby rivers. Many other companies in the region also discharge their wastes into these rivers, hence no one is blamed because this action is regarded as a non-point source of pollution.

From the interview, it can be concluded that external factors like regulations and enforcement have a positive effect on the environmental performance of surveyed companies in HCMC. However these effects are still weak at present.

4.3.5. Firms' perception of Decree 67

Another important concern of the study is to get the firms' opinion on *Decree 67*. The survey obtained information on the firms' perceptions of wastewater fees and how these perceptions affect or influence their actions related to the firms' environmental performance.

In spite of some obstacles occurring in its implementation, *Decree 67* basically had a positive impact on the environmental performance of industrial firms in Hanoi and HCMC in terms of raising awareness of environmental protection. Firms, which for a long time were unfamiliar with payment for environmental costs, now had to bear part of the cost of protecting the environment because they generate pollution. According to the survey results, all firm managers indicated that their awareness of the environment has improved significantly. Said one firm manager: *"Our company is small. We do not have an environmental expert. I was very surprised when one day I received a wastewater fee notice from Hanoi DoNRE. I even don't understand what COD, TSS stand for. I made a phone call to my friend to ask for a help and for more information."*

Among the surveyed companies, only 33 firms reported that they received written notice related to wastewater fee from Hanoi and HCMC DoNRE. From 2004 to 2007, 46 percent of them paid three times, 36 percent twice, and 18 percent only once.

Despite the higher awareness of environmental issue, a large number of the surveyed companies managers have no deep knowledge of the subject matter. A third (34%) of the interviewees think that paying the fees means having the right to pollute. This situation is very dangerous since it may imply an adverse impact of the policy on regulated firms. If the fee level is low, firms would rather pay the wastewater fees than improve their environmental performance[16]. The current fee rates in Vietnam are about 10 times smaller than those in other countries in Asia; they need to be revised.

In general, over the period 2004-2006, there have been different trends in the average wastewater fees paid by the surveyed firms in both Hanoi and HCMC. This raises the question of whether or not any change has occurred in the environmental attitude of the firms. Have the firms tried to reduce their pollution since the fees was introduced or not? Why do some firms always comply with the regulations by paying wastewater fee, but other do not?

The interviews with several firms' managers revealed three main reasons why firms do not pay the fees.

First, firms that use tap water provided by municipal water companies in their production are not willing to pay wastewater fees because the water supply companies are already collecting wastewater fees or sanitation fees. The companies see no reason for the second payment. In such case, it would appear that the EPFIW implemented by DoNRE overlaps

[16] During the interviews, questions were asked about the fee level. However, the interviewees commonly had no comment.

with the wastewater fee being collected by the water supply companies. A similar situation exists with the respect to firms located in industrial estates.

Second, the firm does not agree with the data provided by the agency. The amount of fees to be paid is based on the firm's self-environmental report, which is appraised by the DoNRE inspector. In some cases, the data provided by the company and DoNRE differ.

Last but not least, environmental regulations are not equally applied to firms. Many other firms performed badly but they did not have to pay for wastewater. In some cases, the firm prefers to pay the fines instead of the wastewater fee, since the administrative fine for violations is very low[17]. This situation is not good for the environment for two reasons: (1) the unequal treatment discourages firms from having a concerned attitude toward the environment, and (2) the bad environmental performers will not improve their performance over time.

The survey results also point out some other weaknesses of *Decree 67*. From the firms' perspective, *Decree 67* is not sufficiently clear and detailed and therefore it is not easy for firms to comply with it (Table 19). Some firms would call the local DoNRE to ask for more information on wastewater sampling, declaration and appraisal, etc. However, they found it difficult to contact the DoNRE staff or get sufficient information from them. This situation reveals the work overload at the environmental management agency both in Hanoi and HCMC. To unload the agencies, collection of charges or fees should be handled by other agencies instead of being made the function of managers and professionals at the environmental management agency.

Table 19. Main disadvantages of EPFIW as perceived by firms.

Disadvantage	% of total
The mechanism is not clear and is complicated	57
No economic incentives for better environmental performance	15
Very high charge rate	5
Lack of information	14
Too many pollutant parameters	19

Some interviewed firms were reluctant to comment on the current environmental legislation, and what petitions could be made to policymakers. However, the survey results show that there is room for the state environmental agencies to improve the way they carry out their responsibilities.

[17] According to Decree No.81/2006/ND-CP dated 09 August 2006 on the regulations on Administrative Penalties for environmental protection, a maximum administrative penalty of up to VND70 million (USD4,375) may be imposed. In reality, as the interviews with environmental regulators revealed, the average fine of only VND5-10 million (USD300-600) was imposed. Comparing the cost of treating wastewater and the penalty, one can easily see that non-compliance with the law is less costly than compliance.

Transparency and equity were of interest to all respondents. Despite the fact that the current EPFIW remains very low, they still thought that a policy that lacks openly shared information cannot be workable.

Their view was that the state agencies should send industrial establishments all the necessary legal documents so that the firms would have a better grasp of the laws and regulations. Moreover, the local authorities should provide the firms with detailed guidance on the implementation of *Decree 67*.

Another useful insight raised is that DoNRE has the responsibility of not only monitoring compliance but disseminating information on pollution abatement technologies and high quality of laboratory and standardized testing, analysis centers/labs, and accrediting agencies.

Some firms even expressed the view that the feasibility and relevance of some environmental parameters should be reexamined. For example, the firms in HCMC showed that charging the fee based on BOD and COD concentration is not fair enough since these two parameters are so similar.

Regarding the firms' opinion on the basis for charging the EPFIW, 54 percent preferred a self-environmental report; 28 percent suggested the use of fixed fees; 12 percent preferred the water consumption approach, and 6 percent would like the data provided by DONRE to serve as basis of charging EPFIW.

5. RECOMMENDATIONS

Applying economic instruments in environmental management is the right approach to managing the current environmental pollution in Vietnam. With the implementation of *Decree 67*, the Government of Vietnam has clearly signaled that it is embarking on a significantly greater use of economic instruments as a policy tool to prevent the further degradation of the country's environment and to improve environmental quality (Laplante 2006b). To implement *Decree 67* more effectively, several actions, as discussed below, should be taken.

5.1. Who should be targeted?

The study showed that the number of targeted industrial companies is simply too large for most DoNRE to cover. Given the limited environmental management capacity at all levels, it is strongly recommended that the EPFIW should target only the big firms[18] in specific industrial sectors with high pollution intensity. In order to do so, the targeted group of industries must be clarified first. The potential industries include paper, garment, leather and shoes, chemical, beverages, seafood, sugarcane, and milk. In a recent exercise undertaken in the context of Vietnam's Country Environmental Analysis, it was estimated that three industrial sectors (i.e., corrugated paper and paperboard –

[18] The concept/definition of „big' would remain to be further discussed.

VSIC 2102; pulp and paper – VSIC 2101; and dairy products – VSIC 1520) contribute in excess of 45 percent of all BOD discharges by the manufacturing sector. Similarly, it was estimated that three sectors (fertilizers and nitrogen compounds – VSIC 2412; basic iron and steel – VSIC 2710; and basic chemicals excluding fertilizers and nitrogen compounds – VSIC 2411) contribute to approximately 40 percent of all heavy metal discharges by the manufacturing sector. While there remains uncertainty on the above numbers, an important but simple message is that some industrial sectors generate more pollution than others, and that a significant reduction in discharges of industrial pollution could be achieved by targeting a limited number of industrial sectors. This targeting would greatly facilitate the task of all DoNREs to successfully implement *Decree 67*.

5.2. What pollution parameters should be covered?

There is evidence from the Hanoi and HCMC case studies that the EPFIW collected mainly comes from BOD, COD, and TSS. These pollutants are more frequently reported by industrial firms and actually easily measured and monitored at a low cost. On the other hand, the capacity of DoNRE and the enterprises to monitor heavy metals concentration in discharged effluents is extremely limited. In addition, such measurement is typically very costly.

In order to effectively implement *Decree 67*, it is recommended that EPFIW be applied to a limited number of pollutants such as COD and TSS. The experience of other countries is that the more simple the system, the more implementable and workable it is. The Philippines has been successful in applying EPFIW to BOD and TSS, and Malaysia substantially reduced pollution discharges from the palm oil industry by targeting only BOD. Admittedly these experiences may not be enough to give an apt answer to Vietnam, however they can serve as useful references.

5.3. How should the fee be structured?

The goals of the Decree 67 are: (1) to limit the environmental pollution caused by wastewater, (2) to use economically clean water, and (3) to generate funds for environmental protection activities. Of these, changing the behavior of polluters and revenue raising are of great concern. As shown in most case studies, pollution charges mainly have a revenue-raising role rather than an incentive effect.

The fee structure implemented by *Decree 67* is made simply of a pollution fee, without a fixed fee to be paid by all targeted facilities. *Decree 67* specifies a minimum and maximum level of fees for each targeted pollutant. The two important functions mentioned above cannot be adequately achieved by a single pollution fee. In this regard, two-part fee schemes are of great interest as they separate the revenue generating function of the pollution fee scheme from its function of creating incentives for pollution control. Both the Philippines and Malaysia have adopted two-part fee schemes: one part is a fixed fee that serves as an administrative fee to be paid by all those targeted by the fee scheme, and the other part is the pollution fee.

To limit the number of targeted industrial facilities and implement *Decree 67* in a cost-effective manner and to promote its revenue generating function, it is recommended that small[19] facilities within the targeted industrial sectors be excluded from the payment of the pollution fee. Such facilities could just be solely charged an annual fixed fee. If a two-part tariff were to be adopted as recommended above, these „small' facilities could be requested to pay only the fixed fee of the two-part tariff.

5.4. What should be the fee level?

Another issue is whether a high or low fee level should be set. A high pollution fee may create a strong incentive for pollution control and consequently will not generate significant revenues. In addition, needless to say, an earlier adoption of a high fee level will provide cleaner environment sooner. On the other hand, the low level fee approach may look less burdensome for enterprises in a developing country like Vietnam, but it may fail to create incentives for pollution control. Other Asian countries like China, the Philippines, and Malaysia are implementing a higher pollution fee in comparison with Vietnam.

However, with the current socioeconomic development context of Vietnam, it is recommended that Vietnam should start with a low level fee (i.e., with the current level), and revise and raise substantially every five years. However, in almost all cases of pollution fees it has been noted that inflation slowly erodes the real value of the pollution fee. Reviewing the charge for inflation annually is difficult, and often politically not possible. Given the high inflation rate (12.5%) in Vietnam in 2007 (Thuong 2007), it is strongly recommended to automatically index the fee on an annual basis by the value of the consumer price index in order to protect the real value of the EPFIW.

5.5. Who should be responsible for fee collection and management?

The implementation of *Decree 67* showed the lack of clarity and overlapping of responsibilities among DoNRE, the water supply companies, and the IP/IZ Management Board in terms of setting and collecting wastewater fees. However, it is of importance to keep in perspective that the key objective of *Decree 67* is to reduce pollution. As such, the lead implementing agency should be DoNRE. It should integrate the effluent fee within a strong enforcement and regulatory program. The water supply companies and IP/IZ Management Board are supporting organs that assist DoNRE to fulfill its task. It would be helpful to specify clearly in which circumstances a wastewater fee (or sanitation fee) can be collected by a water supply or water sanitation company, and when the environmental protection fee can be collected by DoNRE.

Since fee collection and management are part of DoNRE's functions, it is necessary to set up a specialized division/subdivision/team dedicated to these functions. Pollution prevention using a market-based instrument needs personnel with administrative

[19] The concept/definition of „small' would also remain to be further discussed.

experience and environmental and economic knowledge who can manage the programs and conduct effective monitoring and inspection. The number of environmental staff in Hanoi and HCMC DoNREs in particular and in Vietnam in general is very small in comparison with other countries[20]. DoNRE should formulate a plan for improved staffing as well as a staff development program.

5.6. Other issues

Experience shows that there are cases that targets are not implemented as scheduled because of the lack of pre-conditions for policy implementation.

In Vietnam, there is an information gap which impedes interaction between managing agencies and businesses. Data from different government agencies like GSO, MPI, MoF, and MoNRE may not be compatible. This results in inefficiency. Industrial establishments are generally familiar with the industrial code system used by the GSO of the Ministry of Planning and Investment (MPI). For the purpose of definition and of cross-tabulation between MoNRE's and MPI's databases, it is recommended to establish an electronic database and standardized Vietnamese industrial classification code when listing the industrial sectors subjected to the EPFIW. Such system can greatly reduce the cost of implementation.

To implement Decree 67 effectively, Vietnam needs to establish a system of high quality and standardized testing/analysis centers/laboratories and accrediting agencies with sufficient staff and measuring equipment. The list of such centers/labs should be widely disseminated to the business sector. Such information can help business enterprises to check and analyze their environmental performance including wastewater sampling in effective ways as well as save on retesting and examination costs. Moreover, the entry of private labs, testing and accrediting organizations should also be welcomed in order to expand services and introduce competition.

Finally it is recommended to set up a system of fines and penalties for firms that fail to pay their EPFIW. There are regulations on Administrative Penalties related to environmental protection but these do not cover noncompliance by firms subject to EPFIW. The fine should be 5-10 times the value of total EPFIW of a given company to create incentive for better behavior.

To realize all of the above recommendations, Vietnam should have a concrete and transparent roadmap with sufficient details and reasonable schedule for implementing *Decree 67*. To do so, consideration should be given to: (i) environmental achievement which is frontloaded as much as possible for the benefit people; (ii) coverage of targeted industries, firms, and pollutants; (iii) installation of required pre-conditions for effective implementation; and (iv) pre-announcement of a clear long-term roadmap to related stakeholders in order to minimize transition and adjustment costs. It is of extreme

[20] Vietnam has only two to four environmental officials for every one million persons. In comparison, China has 20 environmental officials per one million persons; Thailand has 30, and Cambodia has about 100.

importance that all incentive/measures must be available equally to all types of enterprises subject to EPFIW charging. Without this, no policy can become successful.

6. CONCLUSIONS

This study relied on different sources of information, including a survey of firms and interviews with regulators and researchers.

In general, charging the cost of polluting the environment is the right approach to managing the current environmental pollution in Vietnam. *Decree 67* has been very successful in raising environmental awareness among the different stakeholders, especially business enterprises. Moreover, the declining trend in average fee paid by industrial firms in general and firms in the food processing industry in particular may reflect the slight effect of *Decree 67* in inducing changes in pollution control behavior of firms. However, the declining trend may also imply some weaknesses in the implementation process. The limitations may include lack of appropriate knowledge, awareness, and management capacity at all levels. There is little or no evidence that the top government agencies have sufficient (environmental/financial) knowledge and capacity to wisely implement *Decree 67*. The resulting loose cooperation between the state management agencies at both central and local levels hampers the implementation of environmental regulations.

Regarding the firms environmental performance, the survey results indicate that the environmental performance has been rather poor in the food processing industry. This may cause negative impacts on the environment and human health. Most food processing companies show little concern for environmental improvement. They are not under much pressure to change: the products still sell quite well in the domestic market; environmental costs are not fully internalized into the business due to poor enforcement of regulations; and there is no internal or very low demand to improve working conditions.

The government remains to be the most important source of pressure on food companies to improve their environmental performance. However, the effects of governmental regulations largely depend on the agencies' enforcement and inspection capacity. Also, exposure to the export market can be a potential source of motivation for firms to have good environmental performance, particularly when enterprises try to expand their market. This is because environmental and related regulations and standards in exports markets are more severe than in Vietnam. The other sources of pressure for environmental improvement include the general public and type of firm ownership, however, their impacts are still small at present.

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8. APPENDICES

Appendix 1

DECREE No. 67/2003/ND-CP OF JUNE 13, 2003 ON ENVIRONMENTAL PROTECTION CHARGES FOR WASTE WATER

THE GOVERNMENT

Pursuant to the Law on Organize of the' Government of December 25, 2001;
Pursuant to the Law on Environmental Protection of December 27, 1993;
Pursuant to the Law on Water Resource of May 20, 1993;
Pursuant to the Ordinance on Charges and Fees of August 28, 2001;
In order to limit the environmental pollution caused by waste water; to economically use clean water and create the funding source for the Environmental Protection Fund in protecting the environment and addressing the environmental pollution,
At the proposal of the Finance Minister;

DECREES:

Chapter I

GENERAL PROVISIONS

Article 1.- This Decree prescribes the environ- mental protection charges for waste water; the regime of collection, remittance, management and use of the environmental protection charges for waste water.

***Article* 2.-**

1. Subject to the environmental protection charges for waste water prescribed in this Decree are industrial waste water and daily-life waste water.

2. Industrial waste water means water discharged into the environment from industrial production establishments and agricultural, forestry and aquatic product processing establishments.

3. Daily-life waste water means water discharged into the environment from households and organizations other than the subjects specified in Clause 2 of this Article.

***Article* 3.-** Organizations and households discharging waste water defined in Article 2 of this Decree are liable to pay the environmental protection charges for waste water.

***Article* 4.-** The environmental protection charges for waste water shall not be collected in the following cases:

1. Water run off from hydroelectric power plants, water circulated in power plants;

2. Sea water discharged after being used in the salt production;

3. Daily-life waste water from households in geographical areas currently enjoying the price subsidy by the State in order to keep water prices suitable to the socio-economic life;

4. Daily-life waste water from households in communes in rural areas and localities where clean water supply systems are not available yet.

***Article* 5**.- In cases where international treaties which the Socialist Republic of Vietnam has signed or acceded to contain provisions different from those of this Decree, the provisions of such international treaties shall apply.

Chapter II

RATES OF THE ENVIRONMENTAL PROTECTION CHARGES FOR WASTE WATER, THE REGIME OF COLLECTION, REMITTANCE, MANAGEMENT AND USE THEREOF

***Article* 6.-** Rates of environmental protection charges for waste water are prescribed as follows:

1. For daily-life waste water, the environmental protection charge rates shall be "calculated in percentage (%) of the selling price of 1 m3 (one cubic meter) of clean

water but must not exceed 10% (ten percent) of non- VAT clean water selling price. For daily-life waste water discharged from organizations and households which exploit by themselves water for use (except for households in localities where exists no clean water supply systems), the charge rate shall be determined for each water user and based on the average clean water use volume per head in the commune or ward where water is exploited, and on the average supply price of 1 m3 of clean water in the locality.

2. The environmental protection charge rates applicable to industrial waste water and calculated for each pollutant are prescribed as follows:

Ordinal number	Pollutant in wastewater		Fee level (VND/kg of pollutant in wastewater)	
	Name	Symbols	Minimum	Maximum
1	Biochemical Oxygen Demand	A_{BOD}	100	300
2	Chemical Oxygen Demand	A_{COD}	100	300
3	Suspended solids	A_{TSS}	200	400
4	Mercury	A_{Hg}	10,000,000	20,000,000
5	Lead	A_{Pb}	300,000	500,000
6	Arcenic	A_{As}	600,000	1,000,000
7	Cadmium	A_{Cd}	600,000	1,000,000

***Article* 7.-**

1. Basing themselves o~ the provisions on the environmental protection charge rates for daily-life waste water in Clause 1, Article 6 of this Decree, the socio-economic situation and living conditions as well as incomes of their local population, the People's Councils of the provinces and centrally-run cities shall decide on specific rates of the environmental protection charges for daily-life waste water applicable to each geographical area and each subject in their localities.

2. Basing itself on the bracket of the environmental protection charge rates for industrial waste water prescribed in Clause 2, Article 6 of this Decree, the Finance Ministry shall coordinate with the Ministry of Natural Resources and Environment in prescribing specific environmental protection charge rate for each pollutant in industrial waste water to suit each environment into which waste water is discharged and each business line; and

guide the calculation of environmental protection charge amounts for industrial waste water to be paid by charge payers.

***Article* 8.-** The environmental protection charges for waste water constitutes a State budget revenue and shall be managed and used as follows:

1. Part of the collected charges shall be left to the agencies or units directly collecting the charges to defray the expenses for charge collection; cover expenses for assessment and sampling of waste water for analysis in service of the periodical or extraordinary examination of industrial waste water from the second time on.

2. The remainder shall be remitted into the State budget and distributed to the State budget levels as follows:

a/ The central budget shall enjoy 50% thereof, which shall be added to operation capital of Vietnam Environmental Protection Fund under the Prime Minister's Decision No. 82/2002/00- TTg of June 26, 2002 on the establishment, organization and operation of Vietnam Environmental Protection Fund.

b/The local budgets shall enjoy 50% thereof, which shall be used for environmental protection, new investment projects, sewerage dredging, regular repair and maintenance of local water drainage systems.

3. The Finance Ministry shall guide in detail the management and use of the collected environmental protection charge for waste water prescribed in this Article.

***Article* 9.-** The expenses for assessment and first- time collection of waste water samples for analysis in service of the calculation of environmental protection charge amounts for industrial waste water shall be covered by State budget.

The Ministry of Natural Resources and Environment shall prescribe the assessment and first-time collection of waste water samples for analysis in service of the calculation of payable environmental protection charge amounts.

Article 10.-

1. Payers of environmental protection charges for .daily-life waste water are obliged to pay environmental protection charge amounts for waste water fully and on time to the clean water supply units. Monthly, clean water Supply units shall have to remit the collected charge amounts into the State budget, after deducting the collected charge amount portions allowed to be left to them as prescribed in Clause 1, Article 8 of this Decree.

2. Payers of environmental protection charge for industrial waste water are obliged to:

a/ Declare payable charge amounts on a quarter basis with the provincial/municipal Services of Natural Resources and Environment of localities where waste water is discharged in compliance with the regulations and an accurate manner;

b/ Remit fully and on time remittable charge amounts into the account of environmental protection charge for waste water at the local State Treasury offices according to notices;

c/ Make annual settlements of payable charge amount$ with the provincial/municipal Services of Natural Resources and Environment.

***Article* 11**.- The provincial/municipal Services of Natural Resources and Environment shall have to examine the written declarations of environmental protection charge for industrial waste water, issue notices of payable charge amounts, organize the collection and remittance of charge amounts into the State budget, and make the final settlement of environmental protection charge amounts for industrial waste water paid by charge payers.

***Article* 12.-** Within 60 days from January 1st of each calendar year, the clean water supply units and the provincial/municipal Services of Natural Resources and Environment shall have to make the final settlement of the collection, remittance, management and use of charge ~mounts collected in their localities in the preceding~ year with the tax offices according to the prescribed regime.

***Article* 13.-** Tax offices shall have to inspect, urge and make the final settlement of the collection, remittance, management and use of the environmental protection charges for waste water by clean water supply units and *the* provincial/municipal Services of Natural Resources and, Environment.

Chapter III

IMPLEMENTATION PROVISIONS

***Article* 14.-** Complaints and denunciations about the collection, remittance, management and use of the environmental protection charges for waste water prescribed in this Decree and the settlement thereof shall be made in compliance with the provisions of the legislation on complaints and denunciations as well as the legislation on fees and charges..

***Article* 15.-** Payers of environmental protection charges for waste water, that violate the provisions of this Decree, shall be handled according to the provisions of the legislation on fees and charges, If a they also violate the provisions of the legislation environmental protection and the legislation on water resource, they shall also be handled according to the provisions of those legislations.

***Article* 16.-** This Decree shall take *effect* as from January 1, 2004.

***Article* 17**.- The Finance Ministry shall assume the prime responsibility and coordinate with the Ministry of Natural Resources and Environment in guiding the implementation of this Decree.

***Article* 18.-** The ministers, the heads of the ministerial-level agencies, the heads of the agencies attached to the Government and the presidents of the People's Committees of the provinces or centrally- run cities shall have to implement this Decree.

On behalf of the Government

Prime Minister

PHAN VAN KHAI